

REMARKS

Claim 1 has been amended to recite that the L-lactic acid unit-containing resin (1) is a homopolymer of L-lactic acid, and that the D-lactic acid unit-containing resin (2) is a copolymer of D-lactic acid and a saccharide. Furthermore, as recited in amended claim 1, resin (2) is present in an amount of from 3 to 25 parts by weight by 100 parts by weight of resin (1). Claims 7 and 9 have been amended to conform with the amendment to claim 1. Claims 8, 11, 12 and 13 have been canceled. The claim amendments find support in Example 5 and Table 4 at page 23 of the specification (resin composition prepared by mixing a homopolymer of L-lactic acid as resin (1) and a copolymer of D-lactic acid and a saccharide as the resin (2) in amounts ranging from 3 to 25 parts by weight per 100 parts by weight of resin (1)).

Support for claim 14 is found bridging pages 9-10 of the specification. Support for claim 15 is found in Example 5, where resin (2) was prepared by co-polymerizing 30 kg of D-lactic acid and 30 g of corn starch.

With respect to new claim 16, Table 4 at page 23 of the specification shows resin compositions where resin (2) consists of units derived from D-lactic acid and a saccharide.

Entry of the amendments and review and reconsideration on the merits are requested.

In response to the rejection under 35 U.S.C. § 112, first paragraph, the recitation with respect to optical purity has been deleted.

Claims 1, 7-9 and 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kuroki et al in view of JP 2003-096285 (JP '285) and U.S. Patent 6,140,458 to Terado et al.

Kuroki et al was cited as disclosing a polyester resin composition and molded article, and more particularly, aliphatic polyesters comprising polyfunctional polysaccharides and lactic acid units. Although Kuroki et al is said to disclose the use of L-lactic acid or D-lactic acid, the Examiner acknowledged that Kuroki et al does not disclose mixtures of both. The Examiner relied on JP '285 as disclosing mixing D-lactic acid and L-lactic acid resins so as to form a polylactic acid stereo complex having a high melting point. The reason for rejection was that it would have been obvious to include in Kuroki et al a mixture of a L-lactic acid resin and a D-lactic acid resin as taught by JP '285 in order to prepare a molded article having superior moldability. Terado et al was cited as disclosing the production of polylactic acid polymers having an optical purity of at least 95%.

Applicants respectfully submit that the amended claims are patentable over the cited prior art for the following reasons.

As claimed in amended claim 1, the biodegradable resin composition comprises resin (1) which is a homopolymer of L-lactic acid and resin (2) which is a copolymer of D-lactic acid and a saccharide, where resin (2) is present in an amount of 3 to 25 parts by weight per 100 parts by weight of resin (1).

Amended claim 1, as described above, reads on the preferred embodiment of the invention as illustrated in Example 5 at page 23 of the specification. Therein, resin (1) which is a homopolymer of L-lactic acid was mixed with resin (2), a copolymer of D-lactic acid and a saccharide in amounts ranging from 0 to 25 parts by weight per 100 parts by weight of resin (1).

The resin composition thus prepared were evaluated with respect to melting point and crystallization rate, the results of which are set forth in Table 4 reproduced below.

No.	13	14	15	16	17	18
Resin (1)	100	100	100	100	100	100
Resin (2)	-	1	3	5	11	25
Melting point (°C)	183	182	188	187	187	200
Crystallization rate	Small	Small	Medium	Large	Large	Large

As discussed at pages 12-13 of the specification, the biodegradable resin composition of the invention has an improved crystallization rate, i.e., an increased crystallization rate. Thereby, crystallization is rapidly completed during the molding step of the composition and thus heat deformation of the resulting molten article is remarkably inhibited. As shown in Table 4, Sample Nos. 15 to 18 containing resin (2) in an amount of from 3 to 25 parts by weight per 100 parts by weight of resin (1) provided both a higher melting point and crystallization rate as compared to Sample Nos. 13 and 14 containing resin (2) in an amount of less than 3 parts by weight per 100 parts by weight of resin (1). Table 5 at page 25 of the specification further shows good molding properties for resin compositions containing resin (2) in an amount of 10 or 20 parts by weight per 100 parts by weight of resin (1). The above-noted result established criticality in the claimed content range of resin (2) relative to resin (1) where resin (1) is restricted to a homopolymer of L-lactic acid and resin (2) is a copolymer of D-lactic acid and a saccharide, which results could not have been expected from the cited prior art.

As acknowledged by the Examiner, Kuroki et al does not disclose mixtures of first and second resins comprising L-lactic acid units and D-lactic acid units, respectively. Although JP '285 is said to disclose mixing D-lactic acid and L-lactic acid resins, the mixing weight ratio of

poly L-lactic to poly D-lactic acid is preferably 90:10 to 10:90, more preferably 75:25 to 25:75, and particularly preferably 60:40 to 40:60 (paragraph [0024]). The mixing weight ratios in the working examples of JP '285 are all 50:50. Assuming *arguendo* that it would have been obvious to include in Kuroki et al a mixture of a L-lactic acid resin and a D-lactic acid resin as taught by JP '285, the resulting combination still does not teach or suggest criticality in the claimed mixing ratio of resin (2) in an amount of from 3 to 25 parts by weight per 100 parts by weight of resin (1) as required by the amended claims. Moreover, there is nothing in the cited prior art which suggests that an enhanced crystallization rate is obtainable in the claimed ratio range for a specific resin composition where resin (1) is a homopolymer of L-lactic acid and resin (2) is a copolymer of D-lactic acid and a saccharide. More particularly, neither Kuroki et al (racemic copolymer of D/L-lactic acid and a saccharide) nor JP '285 (simple melt mixture of poly L-lactic acid and poly D-lactic acid), considered alone or in combination thereof, would give reason to one of ordinary skill in this field of art to arrive at the specifically claimed biodegradable resin composition having an enhanced crystallization rate.

Therefore, in view of the amendment to the claims, the test data presented in the specification and the above remarks, it is respectfully submitted that the present claims are patentable over Kuroki et al and JP '285, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1, 7, 9 and 14-16 is earnestly solicited.

AMENDMENT UNDER 37 C.F.R. §1.114(c)
U.S. Appln. No. 10/787,415

Attorney Docket No.: Q80109

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Abraham J. Rosner
Registration No. 33,276

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON DC SUGHRUE/265550

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